Claims

1. An optical apparatus for magnification, comprising:

   an objective reflecting surface in the shape a truncated half-paraboloid formed by revolving a parabola about its axis for only 180 degrees of a full a revolution such that there is a plane defined by the optical axis and the parabolic edge of the surfaces,

   ocular reflecting surface of same shape but of different size,

   a means of positioning said objective reflecting surface and said ocular reflecting surface such that their axes are substantially colinear but point in opposite directions, their focal points are at substantially the same shared point, they are on opposite sides of the shared focal point, and the planes formed between the optical axis and the parabolic edge of each surface are in the same plane in space,

   whereby a virtual image may be magnified or demagnified.

2. The apparatus of Claim 1 wherein the means of positioning the two surfaces is a solid material that is transparent and fills the inner space between the two surfaces, whereby magnification can be performed with a single solid object.

3. The apparatus of Claim 2 wherein the surfaces are reflecting because the trasparent solid material has a higher index of refraction than the outer side of the surface, whereby magnification can be performed with a single solid object with no losses due to reflection from metal or losses from internal air-material interfaces.

4. The apparatus of Claim 2 wherein the surfaces are reflecting because of the application of a specular material to the trasparent solid material where the reflecting surfaces are formed, whereby mangification can be performed with a single solid object.

5. The apparatus of Claim 1 wherein the surfaces are shiny mirrors held in place from their non-shiny sides.

6. The apparatus of Claim 1 repeated many times in a planar array such that the optical axis of each apparatus is parallel, whereby optical energy can be captured by a device which is thin and light relative to its collecting area.

7. The array of Claim 6 wherein each cell is a apparatus of Claim 2 and the cells are held in place substantially through the structural solidity of the transparent material that is the optical medium, whereby optical energy can be captured by a single shaped object that is thin and light relative to its collecting area.

8. The array of Claim 7 wherein each cell is is a apparatus of Claim 3, whereby solar energy can be col-

lected from a single solid object made out of a structural transparent material with no internal air-material interface that is thin and light relative to its collecting area.

9. The array of Claim 8 wherein each cell feeds solar energy into a flexible light guide, whereby solar energy be collected from a single solid object made out of a structural transparent material with no internal air-material interface that is thin and light relatvie to its collecting area and transported to a convenient distant place.

10. The apparatus of Claim 1 with light baffles whereby a reflecting telescope with an unobstructed aperture of semicircular shape may be constructed.

11. The apparatus of Claim 3 with light baffles whereby a reflecting telescope with an unobstructed aperture may be constructed having no internal refraction or reflection losses.

12. The apparatus of Claim 1 and reflecting surfaces capable of reflecting higher-than optical frequency radiation and baffles limiting radiation to those surfaces that can serve to magnify or demagnify very high freqency radiation.

13. An optical apparatus for radiation concentration or diffusion, comprising:

an objective reflecting surface in the shape a truncated half-parabola formed by taking a truncated portion of one-half of a parabola from the vertex of the parabola to some other arbitrary point of

truncation following a path from the vertex in one direction,

an ocular reflecting surface of same shape but of different size,

a means of positioning said objective reflecting surface and said ocular reflecting surface such that their axes are substantially colinear but point in opposite directions, their focal points are at substantially the same shared point, and they are on opposite sides of the shared focal point.

whereby a two-dimensional virtual image may be magnified or demagnified or a three-dimensional radiation diffused or collected.

14. The apparatus of Claim 13 wherein the means of positioning the two surfaces is a solid material that is transparent and fills the inner space between the two surfaces, whereby magnification can be performed with a single solid object.

15. The apparatus of Claim 14 wherein the surfaces are reflecting because the trasparent solid material has a higher index of refraction than the outer side of the surface, whereby magnification can be performed with a single solid object with no losses due to reflection from metal or losses from internal air-material interfaces.

16. The apparatus of Claim 13 wherein the surfaces are shiny mirrors held in place from their non-shiny sides.

17. The apparatus of Claim 13 repeated many times in a planar array such that the optical axis of each apparatus is parallel, whereby optical energy can be captured by a device which is thin and light relative to its collecting area.

18. The array of Claim 17 wherein each cell is is a apparatus of Claim 2 and the cells are held in place substantially through the structural solidity of the transparent material that is the optical medium, whereby optical energy can be captured by a single shaped object that is thin and light relative to its collecting area.

19. The array of Claim 18 wherein each cell is is a apparatus of Claim 3, whereby solar energy can be collected from a single solid object made out of a structural transparent material with no internal air-material interface that is thin and light relative to its collecting area.

20. The array of Claim 19 wherein each cell feeds solar energy into a flexible light guide, whereby solar energy be collected from a single solid object made out of a structural transparent material with no internal air-material interface that is thin and light relatvie to its collecting area and transported to a convenient distant place.